Geology Subject Index
Volume 10

absolute age *see also* geochronology; isotopes

absolute age—applications
changes of level: Uranium-series age of the Eel Point terrace, San Clemente Island, California
(Muhs, D. R., *et al.*) 1: 23

absolute age—dates
drift: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246
gneisses: Reworking of sialic crust as represented in late Archean-age gneisses, northern Labrador
(Collerson, Kenneth D., *et al.*) 4: 202
middens: Use of packrat middens to determine rates of cliff retreat in the eastern Grand Canyon, Arizona
(Cole, Kenneth L., *et al.*) 11: 597
sediments: Lake-sediment evidence for the date of deglaciation of the Hidden Lake area, Kenai Peninsula, Alaska
(Rymer, Michael J., *et al.*) 6: 314
shells: Comparison of uranium-series, radiocarbon, and amino acid data from marine Mollusca, Baffin Island, Arctic Canada; discussion and reply
(Brigham, Julie K., *et al.*) 4: 215
— Comparison of uranium-series, radiocarbon, and amino acid data from marine molluscs, Baffin Island, Arctic Canada; discussion and reply
(Gascoyne, M., *et al.*) 8: 438
volcanic rocks: Late Cenozoic deformation and volcanism in the Blue Mountains of central Oregon; microplate interactions?
(Robyn, Thomas L., *et al.*) 11: 572

absolute age—interpretation
ophiolite: Age and origin of Ballantrae ophiolite and its significance to the Caledonian Orogeny and the Ordovician time scale; discussion and reply
(Barrett, T. J., *et al.*) 6: 331

acoustical surveys *see under* geophysical surveys *under* Atlantic Ocean; British Columbia

aeromagnetic surveys *see* magnetic surveys *under* geophysical surveys *under* Arkansas; Tennessee; United States

Africa *see also* Libya; Morocco

Alaska—geochronology
Pleistocene: Lake-sediment evidence for the date of deglaciation of the Hidden Lake area, Kenai Peninsula, Alaska
(Rymer, Michael J., *et al.*) 6: 314

Alaska—stratigraphy
continental drift: Limits to northward drift of the Paleocene Cantwell Formation, central Alaska
(Hillhouse, John W., *et al.*) 10: 552
Paleocene: Limits to northward drift of the Paleocene Cantwell Formation, central Alaska
(Hillhouse, John W., *et al.*) 10: 552

Alaska—structural geology
tectonics: Geological evidence for post-40 m.y. B.P. large-scale northwestward displacement of part of southeastern Alaska
(Cowan, Darrel S.) 6: 309

algae—stromatolites
Phanerozoic: Stromatolite decline; a reconsideration
(Pratt, Brian R.) 10: 512

algal flora—biostratigraphy
Miocene: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577
Paleogene: Late Eocene-Oligocene magnetostratigraphy and biostratigraphy at South Atlantic DSDP Site 522
(Poore, Richard Z., *et al.*) 10: 508

amino acids *see under* organic materials

angiosperms—Monocotyledoneae
Miocene: Coconuts in Miocene turbidites in New Zealand; possible evidence for tsunami origin of some turbidity currents; discussion
(Murty, T. S.) 9: 489

Antarctica—stratigraphy
Permian: Geological implications of recycled Permian and Triassic palynomorphs in Tertiary rocks of Seymour Island, Antarctic Peninsula
(Askin, Rosemary A., *et al.*) 10: 547
Tertiary: Geological implications of recycled Permian and Triassic palynomorphs in Tertiary rocks of Seymour Island, Antarctic Peninsula
(Askin, Rosemary A., *et al.*) 10: 547
Triassic: Geological implications of recycled Permian and Triassic palynomorphs in Tertiary rocks of Seymour Island, Antarctic Peninsula
(Askin, Rosemary A., *et al.*) 10: 547

Appalachians—stratigraphy
Ordovician: Analogous tectonic evolution of the Ordovician foredeeps, Southern and Central Appalachians
(Shanmugam, G., *et al.*) 11: 562

Appalachians—structural geology
neotectonics: Large-scale patterns of seismicity before and after the 1886 South Carolina earthquake
(Seeber, L., *et al.*) 7: 382
orogeny: Penrose Conference report; Timing of orogenic events in the Appalachian-Caledonian system
(Thomas, William A., *et al.*) 9: 485
tectonics: Master decollement root zone beneath the Southern Appalachians and crustal balance
(Iverson, William P., *et al.*) 5: 241
— Suspect terranes and accretionary history of the Appalachian Orogen
(Williams, Harold, *et al.*) 10: 530

Appalachians—tectonophysics
plate tectonics: Analogous tectonic evolution of the Ordovician foredeeps, Southern and Central Appalachians
(Shanmugam, G., *et al.*) 11: 562
— Geophysical and geochemical evidence for a Hercynian magmatic arc, Maryland to Georgia
(Sinha, A. K., *et al.*) 11: 593
— Tectonic model for kimberlite emplacement in the Appalachian Plateau of Pennsylvania
(Parrish, Jay B., *et al.*) 7: 344

Arabian Peninsula *see also* Oman

Archean *see also* Precambrian; *see also under* geochronology *under* Labrador

Archean—geochemistry
oxygen: Oxygen in the Precambrian atmosphere; an evaluation of the geological evidence
(Clemmey, Harry, *et al.*) 3: 141

Arctic Ocean—tectonophysics
sea-floor spreading: Origin of seaward-dipping reflectors in oceanic crust off the Norwegian margin by "subaerial sea-floor spreading"
(Mutter, John C., *et al.*) 7: 353

Arizona—geomorphology
erosion features: Use of packrat middens to determine rates of cliff retreat in the eastern Grand Canyon, Arizona
(Cole, Kenneth L., *et al.*) 11: 597

Arizona—tectonophysics
plate tectonics: Tectonic models for Early Cretaceous rifting in southeastern Arizona
(Bilodeau, William L.) 9: 466

Arkansas—geophysical surveys
magnetic surveys: Model of the southeastern margin of the Mississippi Valley graben near Memphis, Tennessee, from interpretation of truck-magnetometer data
(Hildenbrand, T. G.) 9: 476

Asia *see also* China; Far East; Himalayas; Japan; Philippine Islands

Asia—tectonophysics
plate tectonics: Propagating extrusion tectonics in Asia; new insights from simple experiments with plasticine
(Tapponnier, R., *et al.*) 12: 611

associations—general
American Geological Institute: Cross-database, cross-national geologic indexing; problems and solutions
(Rassam, G. N., *et al.*) 11: 600

Atlantic Coastal Plain—engineering geology
geologic hazards: Large-scale patterns of seismicity before and after the 1886 South Carolina earthquake
(Seeber, L., *et al.*) 7: 382

Atlantic Ocean *see also* Gulf of Mexico

Atlantic Ocean—geophysical surveys
acoustical surveys: Morphology, distribution, and development of submarine canyons on the United States Atlantic continental slope between Hudson and Baltimore canyons
(Twichell, David C., *et al.*) 8: 408
— Wilmington submarine canyon; a marine fluvial-like system
(McGregor, Bonnie A., *et al.*) 1: 27
— Wilmington submarine canyon; a marine fluvial-like system; discussion and reply
(Belderson, R. H., *et al.*) 9: 491

Atlantic Ocean—oceanography
continental slope: Extensional model for the subsidence of the northern United States Atlantic continental margin
(Sawyer, D. S., *et al.*) 3: 134
— Morphology, distribution, and development of submarine canyons on the United States Atlantic continental slope between Hudson and Baltimore canyons
(Twichell, David C., *et al.*) 8: 408
— Reconnaissance in DSRV Alvin of a "fluvial-like" meander system in Wilmington Canyon and slump features in South Wilmington Canyon
(Stubblefield, William L., *et al.*) 1: 31
— Wilmington submarine canyon; a marine fluvial-like system
(McGregor, Bonnie A., *et al.*) 1: 27
— Wilmington submarine canyon; a marine fluvial-like system; discussion and reply
(Belderson, R. H., *et al.*) 9: 491
ocean circulation: Blake Plateau; control of Miocene sedimentation patterns by large-scale shifts of the Gulf Stream axis
(Pinet, Paul R., *et al.*) 5: 257

Atlantic Ocean—stratigraphy
changes of level: Micropaleontological documentation for early Holocene fall of relative sea level on the Atlantic coast of Nova Scotia
(Scott, David B., *et al.*) 5: 278
Miocene: Blake Plateau; control of Miocene sedimentation patterns by large-scale shifts of the Gulf Stream axis
(Pinet, Paul R., *et al.*) 5: 257
Paleogene: Late Eocene-Oligocene magnetostratigraphy and biostratigraphy at South Atlantic DSDP Site 522
(Poore, Richard Z., *et al.*) 10: 508

Atlantic Ocean—tectonophysics
crust: Along-strike amplitude variations of oceanic magnetic stripes; are they related to low-temperature hydrothermal circulation?
(Whitmarsh, R. B.) 9: 461
— Extensional model for the subsidence of the northern United States Atlantic continental margin
(Sawyer, D. S., *et al.*) 3: 134
— Extensional model for the subsidence of the northern United States Atlantic continental margin; discussion and reply
(Washington, Paul A., *et al.*) 12: 665
sea-floor spreading: Along-strike amplitude variations of oceanic magnetic stripes; are they related to low-temperature hydrothermal circulation?
(Whitmarsh, R. B.) 9: 461

Atlantic region—tectonophysics
plate tectonics: Preliminary model for an early transform history in central Atlantic rifting
(Swanson, Mark T.) 6: 317

atmosphere—circulation
evolution: Atmospheric circulation during warm geologic periods; is the equator-to-pole surface-temperature gradient the controlling factor?
(Barron, E. J., *et al.*) 12: 633

atmosphere—evolution
composition: Oxygen in the Precambrian atmosphere; an evaluation of the geological evidence
(Clemmey, Harry, *et al.*) 3: 141

Australasia *see also* New Zealand

Australia *see also* New South Wales

automatic data processing—general
international cooperation: Cross-database, cross-national geologic indexing; problems and solutions
(Rassam, G. N., *et al.*) 11: 600

Bahamas—sedimentary petrology
diagenesis: SEM observations on the replacement of Bahaman aragonitic mud by calcite
(Steinen, Randolph P.) 9: 471

basalts *see under* igneous rocks

Basin and Range Province—structural geology
neotectonics: Triple-junction instability as cause for late Cenozoic extension and fragmentation of the western United States
(Ingersoll, Raymond V.) 12: 621
tectonics: Tectonic models for Early Cretaceous rifting in southeastern Arizona
(Bilodeau, William L.) 9: 466

Basin and Range Province—tectonophysics
crust: Magnitude of crustal extension in the southern Great Basin
(Wernicke, Brian, *et al.*) 10: 499

bibliography—general
automatic data processing: Cross-database, cross-national geologic indexing; problems and solutions
(Rassam, G. N., *et al.*) 11: 600

biogeography *see also under* paleontology *under* continental drift

biogeography—problematic fossils
Proterozoic: A case for two late Proterozoic-earliest Cambrian faunal province loci
(McMenamin, Mark A. S.) 6: 290

biography *see also* bibliography

brachiopods—biostratigraphy
Permian: Biostratigraphy and structural setting of the Permian Coyote Butte Formation of central Oregon
(Wardlaw, Bruce R., *et al.*) 1: 13

British Columbia—engineering geology
slope stability: Morphology of a submarine slide, Kitimat Arm, British Columbia
(Prior, David B., *et al.*) 11: 588

British Columbia—geophysical surveys
acoustical surveys: Morphology of a submarine slide, Kitimat Arm, British Columbia
(Prior, David B., *et al.*) 11: 588

British Columbia—petrology
metamorphic rocks: Geological evidence for post-40 m.y. B.P. large-scale northwestward displacement of part of southeastern Alaska
(Cowan, Darrel S.) 6: 309

California—engineering geology
earthquakes: Earthquake-induced sediment failures on a 0.25° slope, Klamath River delta, California
(Field, Michael E., *et al.*) 10: 542
slope stability: Earthquake-induced sediment failures on a 0.25° slope, Klamath River delta, California
(Field, Michael E., *et al.*) 10: 542

California—geochronology
Pleistocene: Uranium-series age of the Eel Point terrace, San Clemente Island, California
(Muhs, D. R., *et al.*) 1: 23
Quaternary: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124
California—geomorphology
changes of level: Uranium-series age of the Eel Point terrace, San Clemente Island, California
(Muhs, D. R., *et al.*) 1: 23
California—geophysical surveys
gravity surveys: Gravity evidence for a shallow intrusion under Medicine Lake Volcano, California
(Finn, Carol, *et al.*) 10: 503
California—oceanography
continental shelf: Earthquake-induced sediment failures on a 0.25° slope, Klamath River delta, California
(Field, Michael E., *et al.*) 10: 542
California—petrology
igneous rocks: Significance of mid-Mesozoic peridotitic to dioritic intrusive complexes, Klamath Mountains-western Sierra Nevada, California
(Snoke, Arthur W., *et al.*) 3: 162
volcanism: Time-predictable bimodal volcanism in the Coso Range, California
(Bacon, Charles R.) 2: 65
California—sedimentary petrology
diagenesis: Influence of rock composition on kinetics of silica phase changes in the Monterey Formation, Santa Barbara area, California
(Isaacs, Caroline M.) 6: 304
sedimentary rocks: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
California—structural geology
faults: Geophysical character of the proposed eastern extension of the Garlock Fault and adjacent areas, eastern California
(Plescia, J. B., *et al.*) 4: 209
neotectonics: Kinematic evolution of the junction of the San Andreas, Garlock, and Big Pine faults, California
(Bohannon, Robert G., *et al.*) 7: 358
— Uranium-series age of the Eel Point terrace, San Clemente Island, California
(Muhs, D. R., *et al.*) 1: 23
tectonics: Major right-lateral faulting in the Franciscan assemblage of northern California in late Tertiary time
(Kelsey, Harvey M., *et al.*) 7: 387
California—tectonophysics
crust: Evolution and thickness of the lithosphere beneath coastal California
(Zandt, George, *et al.*) 7: 376
paleomagnetism: Paleomagnetic study of some Cretaceous and Tertiary sedimentary rocks of the Klamath Mountains province, California
(Mankinen, Edward A., *et al.*) 2: 82
plate tectonics: Cenozoic convergence along the California coast; a qualitative test of the hot-spot approximation
(Carlson, R. L.) 4: 191
— Kinematic evolution of the junction of the San Andreas, Garlock, and Big Pine faults, California
(Bohannon, Robert G., *et al.*) 7: 358
— Petrogenesis of the Conejo volcanic suite, southern California; evidence for mid-ocean ridge-continental margin interactions
(Hurst, Richard W.) 5: 267
Canada *see also* Appalachians; Atlantic Coastal Plain; British Columbia; Canadian Shield; Great Lakes region; Great Plains; Labrador; Northwest Territories; Nova Scotia; Ontario; Rocky Mountains
Canada—petrology
metamorphic rocks: Tectonic accretion and the origin of the two major metamorphic and plutonic welts in the Canadian Cordillera
(Monger, J. W. H., *et al.*) 2: 70
Canadian Shield—geochemistry
trace elements: Trace-element geochemistry of Archean volcanic rocks and crustal growth in southwestern Abitibi Belt, Canada
(Capdevila, R., *et al.*) 8: 418
Canadian Shield—structural geology
orogeny: Coal Creek Serpentinite, Llano Uplift, Texas; a fragment of an incomplete Precambrian ophiolite; discussion and reply
(Thomas, M. D., *et al.*) 8: 440
Canadian Shield—tectonophysics
crust: Concentrically zoned pattern in the Bouguer gravity anomaly map of northeastern North America
(Klasner, J. S., *et al.*) 10: 537
carbon—isotopes
C-13/C-12: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
carbonate rocks *see under* sedimentary rocks
changes of level *see also under* geomorphology *under* California; *see also under* stratigraphy *under* Atlantic Ocean
China—seismology
crust: Velocities and propagation characteristics of Pn and Sn beneath the Himalayan Arc and Tibetan Plateau; possible evidence for underthrusting of Indian continental lithosphere beneath Tibet
(Barazangi, Muawia, *et al.*) 4: 179
clastic rocks *see under* sedimentary rocks
clastic sediments *see under* sediments
clay mineralogy—areal studies
Western U.S.: Clay mineralogy of weathering rinds and possible implications concerning the sources of clay minerals in soils
(Colman, Steven M.) 7: 370
Colorado—petrology
intrusions: Unidirectional solidification textures and their significance in determining relative ages of intrusions at the Henderson Mine, Colorado
(Shannon, J. R., *et al.*) 6: 293
Colorado Plateau—economic geology
uranium ores: Preliminary model of regional Mesozoic groundwater flow and uranium deposition in the Colorado Plateau
(Sanford, Richard F.) 7: 348
congresses *see* symposia
conodonts—biostratigraphy
Mississippian: Mid-Paleozoic age of the Roberts thrust unsettled by new data from northern Nevada
(Ketner, Keith B., *et al.*) 6: 298
Permian: Biostratigraphy and structural setting of the Permian Coyote Butte Formation of central Oregon
(Wardlaw, Bruce R., *et al.*) 1: 13
— Permian-Triassic unconformity in the Terrace Mountains, northwestern Utah
(Paull, Rachel K., *et al.*) 11: 582
Triassic: Permian-Triassic unconformity in the Terrace Mountains, northwestern Utah
(Paull, Rachel K., *et al.*) 11: 582
conservation *see also* land use
conservation—natural resources
soils: Accelerated erosion; process, problems, and prognosis
(Toy, Terrence J.) 10: 524
continental drift *see also under* stratigraphy *under* Alaska
continental drift—Gondwana
Antarctica: Geological implications of recycled Permian and Triassic palynomorphs in Tertiary rocks of Seymour Island, Antarctic Peninsula
(Askin, Rosemary A., *et al.*) 10: 547

continental drift—paleontology
biogeography: A case for two late Proterozoic-earliest Cambrian faunal province loci
(McMenamin, Mark A. S.) 6: 290
continental shelf *see also under* oceanography *under* California; New England
continental slope *see also under* oceanography *under* Atlantic Ocean; Delaware; Eastern U.S.; Greece; Norway
core *see also under* tectonophysics *under* symposia
core—properties
physical properties: Conference report: Earth's core; its structure, evolution, and magnetic field
(Verosub, Kenneth L.) 7: 392
Cretaceous *see also under* stratigraphy *under* Montana; Nevada
Cretaceous—stratigraphy
paleoclimatology: Atmospheric circulation during warm geologic periods; is the equator-to-pole surface-temperature gradient the controlling factor?
(Barron, E. J., *et al.*) 12: 633
crust *see also under* seismology *under* China; Michigan; Norway; *see also under* tectonophysics *under* Atlantic Ocean; Basin and Range Province; California; Canadian Shield; Great Basin; Great Lakes region; North America; Southwestern U.S.
crystal chemistry *see also* minerals
crystal growth *see also* minerals
crystal structure *see also* minerals
deformation *see also* structural analysis
deformation—experimental studies
strain: Propagating extrusion tectonics in Asia; new insights from simple experiments with plasticine
(Tapponnier, R., *et al.*) 12: 611
Delaware—oceanography
continental slope: Reconnaissance in DSRV Alvin of a "fluvial-like" meander system in Wilmington Canyon and slump features in South Wilmington Canyon
(Stubblefield, William L., *et al.*) 1: 31
— Wilmington submarine canyon; a marine fluvial-like system
(McGregor, Bonnie A., *et al.*) 1: 27
— Wilmington submarine canyon; a marine fluvial-like system; discussion and reply
(Belderson, R. H., *et al.*) 9: 491
diagenesis *see also* sedimentation
diagenesis—controls
mineral composition: Influence of rock composition on kinetics of silica phase changes in the Monterey Formation, Santa Barbara area, California
(Isaacs, Caroline M.) 6: 304
diagenesis—dolomitization
geochemistry: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
— Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites; discussions and reply
(Zenger, Donald H., *et al.*) 12: 662
diagenesis—geochemistry
isotopes: Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516
diagenesis—materials
organic materials: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124
diagenesis—processes
calcitization: SEM observations on the replacement of Bahaman aragonitic mud by calcite
(Steinen, Randolph P.) 9: 471
diastrophism *see* orogeny
dolomitization *see under* diagenesis
dolostone *see also under* carbonate rocks *under* sedimentary rocks
earthquakes *see also* seismology; *see also under* engineering geology *under* California; South Carolina; *see also under* seismology *under* Gulf of Mexico; Japan
Eastern Hemisphere *see also* Antarctica; Arctic Ocean; Asia; Atlantic Ocean; Europe; Indian Ocean
Eastern U.S.—oceanography
continental slope: Morphology, distribution, and development of submarine canyons on the United States Atlantic continental slope between Hudson and Baltimore canyons
(Twichell, David C., *et al.*) 8: 408
engineering geology *see also* deformation; geophysical methods; ground water; land use; waste disposal
environmental geology *see also* conservation; land use; waste disposal
epeirogeny *see also* orogeny
erosion *see under* processes *under* geomorphology
Europe *see also* the individual nations
Europe—paleobotany
gymnosperms: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641
pteridophytes: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641
Far East—tectonophysics
plate tectonics: Propagating extrusion tectonics in Asia; new insights from simple experiments with plasticine
(Tapponnier, R., *et al.*) 12: 611
faults—displacements
right-lateral faults: Major right-lateral faulting in the Franciscan assemblage of northern California in late Tertiary time
(Kelsey, Harvey M., *et al.*) 7: 387
strike-slip faults: Kinematic evolution of the junction of the San Andreas, Garlock, and Big Pine faults, California
(Bohannon, Robert G., *et al.*) 7: 358
— Magnitude of crustal extension in the southern Great Basin
(Wernicke, Brian, *et al.*) 10: 499
— Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussion and reply
(Winchester, J. A., *et al.*) 9: 487
— Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussions and reply
(Donovan, R. Nowell, *et al.*) 11: 604
thrust faults: Mid-Paleozoic age of the Roberts thrust unsettled by new data from northern Nevada
(Ketner, Keith B., *et al.*) 6: 298
transcurrent faults: Geological evidence for post-40 m.y. B.P. large-scale northwestward displacement of part of southeastern Alaska
(Cowan, Darrel S.) 6: 309
transform faults: Preliminary model for an early transform history in central Atlantic rifting
(Swanson, Mark T.) 6: 317
faults—distribution
indicators: Joint spacing as a method of locating faults; discussions and reply
(Narr, W., *et al.*) 2: 61
— Joint spacing as a method of locating faults; discussion
(Shepherd, J., *et al.*) 5: 282
interference patterns: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Cress, Leland D., *et al.*) 8: 442
lineaments: Geophysical character of the proposed eastern extension of the Garlock Fault and adjacent areas, eastern California
(Plescia, J. B., *et al.*) 4: 209
patterns: Number and orientation of fault sets in the field and in experiments
(Aydin, Atilla, *et al.*) 2: 107
volcanic rocks: Late Cenozoic deformation and volcanism in the Blue Mountains of central Oregon; microplate interactions?
(Robyn, Thomas L., *et al.*) 11: 572

faults—effects
mylonites: Penrose Conference report; Significance and petrogenesis of mylonitic rocks
(Tullis, Jan, *et al.*) 5: 227
— Seismic velocity and anisotropy in mylonites and the reflectivity of deep crustal fault zones
(Jones, Terry, *et al.*) 5: 260
faults—systems
block structures: Tectonic models for Early Cretaceous rifting in southeastern Arizona
(Bilodeau, William L.) 9: 466
— Triple-junction instability as cause for late Cenozoic extension and fragmentation of the western United States
(Ingersoll, Raymond V.) 12: 621
grabens: Model of the southeastern margin of the Mississippi Valley graben near Memphis, Tennessee, from interpretation of truck-magnetometer data
(Hildenbrand, T. G.) 9: 476
fission-track dating *see under* geochronology
fjords *see under* shore features *under* geomorphology
folds—orientation
nappes: Emplacement of a fold-nappe, Betic Orogen, southern Spain
(Platt, J. P.) 2: 97
foliation *see also* structural analysis
foraminifers—biostratigraphy
Cretaceous: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433
Holocene: Micropaleontological documentation for early Holocene fall of relative sea level on the Atlantic coast of Nova Scotia
(Scott, David B., *et al.*) 5: 278
Miocene: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577
Paleogene: Late Eocene-Oligocene magnetostratigraphy and biostratigraphy at South Atlantic DSDP Site 522
(Poore, Richard Z., *et al.*) 10: 508
Permian: Biostratigraphy and structural setting of the Permian Coyote Butte Formation of central Oregon
(Wardlaw, Bruce R., *et al.*) 1: 13
fossils *see* appropriate fossil group
fossils, problematic *see* problematic fossils
fractures—style
joints: Intensity of systematic joints; methods and application; discussion and reply
(Narr, W., *et al.*) 2: 61
— Joint spacing as a method of locating faults; discussions and reply
(Narr, W., *et al.*) 2: 61
— Joint spacing as a method of locating faults; discussion
(Shepherd, J., *et al.*) 5: 282
— Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273
genesis of ore deposits *see* mineral deposits, genesis
geochemistry—processes
solution: Parabolic dissolution kinetics of silicate minerals; an artifact of nonequilibrium precipitation processes?
(Holdren, George R., Jr., *et al.*) 4: 186
geochemistry—properties
physicochemical properties: Melt infiltration and magma evolution
(Watson, E. Bruce) 5: 236
geochronology *see also* absolute age
geochronology—fission-track dating
quartz: Fission-track dating of sandstone-type uranium deposits
(Rosenberg, Philip E., *et al.*) 9: 481
geochronology—paleomagnetism
magnetostratigraphy: Late Eocene-Oligocene magnetostratigraphy and biostratigraphy at South Atlantic DSDP Site 522
(Poore, Richard Z., *et al.*) 10: 508
— Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153
geochronology—racemization
applications: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124
shells: Comparison of uranium-series, radiocarbon, and amino acid data from marine Mollusca, Baffin Island, Arctic Canada; discussion and reply
(Brigham, Julie K., *et al.*) 4: 215
— Comparison of uranium-series, radiocarbon, and amino acid data from marine molluscs, Baffin Island, Arctic Canada; discussion and reply
(Gascoyne, M., *et al.*) 8: 438
geochronology—time scales
Miocene: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577
Oligocene: Oligocene calibration of the magnetic polarity time scale
(Prothero, Donald R., *et al.*) 12: 650
Ordovician: Age and origin of Ballantrae ophiolite and its significance to the Caledonian Orogeny and the Ordovician time scale; discussion and reply
(Barrett, T. J., *et al.*) 6: 331
geologic hazards *see also under* engineering geology *under* Atlantic Coastal Plain; *see also under* environmental geology *under* Pacific Ocean
geologic hazards—human ecology
erosion: Accelerated erosion; process, problems, and prognosis
(Toy, Terrence J.) 10: 524
geologic hazards—site exploration
radioactive waste: Problems in determination of the water content of rock-salt samples and its significance in nuclear-waste storage siting; discussion
(Kopp, Otto C.) 6: 330
geology—practice
indexing: Cross-database, cross-national geologic indexing; problems and solutions
(Rassam, G. N., *et al.*) 11: 600
geology—principles
uniformitarianism: Twelve fallacies of uniformitarianism
(Shea, James H.) 9: 455
geomorphology *see also* glacial geology
geomorphology—erosion features
cliffs: Use of packrat middens to determine rates of cliff retreat in the eastern Grand Canyon, Arizona
(Colvr, Kenneth L., *et al.*) 11: 597
geomorphology—landform evolution
drainage patterns: Drainage systems developed by sapping on Earth and Mars
(Higgins, Charles G.) 3: 147
geomorphology—processes
denudation: Worldwide continental denudation and climatic deterioration during the late Tertiary; evidence from deep-sea sediments
(Donnelly, Thomas W.) 9: 451
erosion: Accelerated erosion; process, problems, and prognosis
(Toy, Terrence J.) 10: 524
geomorphology—shore features
fjords: Morphology of a submarine slide, Kitimat Arm, British Columbia
(Prior, David B., *et al.*) 11: 588
terraces: Uranium-series age of the Eel Point terrace, San Clemente Island, California
(Muhs, D. R., *et al.*) 1: 23
geophysical methods—magnetic methods
interpretation: Model of the southeastern margin of the Mississippi Valley graben near Memphis, Tennessee, from interpretation of truck-magnetometer data
(Hildenbrand, T. G.) 9: 476
geophysical methods—seismic methods
applications: Estimates of heat flow derived from gas hydrates
(Yamano, M., *et al.*) 7: 339

geophysical surveys *see* acoustical surveys *under* geophysical surveys *under* Atlantic Ocean; British Columbia; *see* gravity surveys *under* geophysical surveys *under* California; *see* magnetic surveys *under* geophysical surveys *under* Arkansas; Tennessee; United States; *see* seismic surveys *under* geophysical surveys *under* Mediterranean Sea; Michigan; *see also* geophysical methods

geophysics *see also* deformation

Georgia—structural geology
tectonics: Master decollement root zone beneath the Southern Appalachians and crustal balance
(Iverson, William P., *et al.*) 5: 241

geosynclines *see also* orogeny

geothermics *see* heat flow

glacial geology *see also* geomorphology

glacial geology—glaciation
deglaciation: Glacial stagnation-zone retreat in New England; bedrock control
(Mulholland, J. W.) 11: 567
— Lake-sediment evidence for the date of deglaciation of the Hidden Lake area, Kenai Peninsula, Alaska
(Rymer, Michael J., *et al.*) 6: 314

glaciation *see under* glacial geology

grabens *see under* systems *under* faults

granites *see under* igneous rocks

gravity surveys *see under* geophysical surveys *under* California

Great Basin—tectonophysics
crust: Magnitude of crustal extension in the southern Great Basin
(Wernicke, Brian, *et al.*) 10: 499

Great Lakes region—tectonophysics
crust: Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273

Great Plains—geochronology
Oligocene: Oligocene calibration of the magnetic polarity time scale
(Prothero, Donald R., *et al.*) 12: 650

Greece—oceanography
continental slope: Structural sketch of the Hellenic continental margin between the western Peloponnesus and eastern Crete
(Mascle, Jean, *et al.*) 2: 113

ground water—surveys
Colorado Plateau: Preliminary model of regional Mesozoic groundwater flow and uranium deposition in the Colorado Plateau
(Sanford, Richard F.) 7: 348

Gulf of Mexico—seismology
earthquakes: Seismicity of the central Gulf of Mexico
(Frohlich, Cliff) 2: 103

gymnosperms—floral studies
Carboniferous: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641

Hawaii—petrology
igneous rocks: Diverse basalt types from Loihi Seamount, Hawaii
(Moore, J. G., *et al.*) 2: 88

heat flow—interpretation
techniques: Estimates of heat flow derived from gas hydrates
(Yamano, M., *et al.*) 7: 339

Himalayas—seismology
mantle: Velocities and propagation characteristics of Pn and Sn beneath the Himalayan Arc and Tibetan Plateau; possible evidence for underthrusting of Indian continental lithosphere beneath Tibet
(Barazangi, Muawia, *et al.*) 4: 179

Holocene *see also under* stratigraphy *under* Nova Scotia

hydrogeology *see also* ground water

hydrology *see also* ground water

Idaho—structural geology
tectonics: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Wernicke, Brian, *et al.*) 1: 3
— Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Cress, Leland D., *et al.*) 8: 442

igneous rocks *see also* magmas; metamorphic rocks; metasomatism; phase equilibria

igneous rocks—basalts
composition: Diverse basalt types from Loihi Seamount, Hawaii
(Moore, J. G., *et al.*) 2: 88
magnetic properties: Along-strike amplitude variations of oceanic magnetic stripes; are they related to low-temperature hydrothermal circulation?
(Whitmarsh, R. B.) 9: 461

igneous rocks—granites
textures: Unidirectional solidification textures and their significance in determining relative ages of intrusions at the Henderson Mine, Colorado
(Shannon, J. R., *et al.*) 6: 293

igneous rocks—plutonic rocks
complexes: Significance of mid-Mesozoic peridotitic to dioritic intrusive complexes, Klamath Mountains-western Sierra Nevada, California
(Snoke, Arthur W., *et al.*) 3: 162

igneous rocks—pyroclastics
textures: Grain orientation and depositional ramps as flow direction indicators of a large-scale pyroclastic flow deposit in Japan
(Suzuki, Keido, *et al.*) 8: 429

igneous rocks—syenites
shonkinite: Magma immiscibility in the Shonkin Sag and Square Butte laccoliths; discussion and reply
(Nash, W. P., *et al.*) 8: 444

igneous rocks—ultramafics
kimberlite: Instability of garnet from the mantle; glass as evidence of metasomatic melting
(Hunter, Robert H., *et al.*) 12: 617
— Tectonic model for kimberlite emplacement in the Appalachian Plateau of Pennsylvania
(Parrish, Jay B., *et al.*) 7: 344
ophiolite: Coal Creek Serpentinite, Llano Uplift, Texas; a fragment of an incomplete Precambrian ophiolite; discussion and reply
(Thomas, M. D., *et al.*) 8: 440

igneous rocks—volcanic rocks
genesis: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433
— Petrogenesis of the Conejo volcanic suite, southern California; evidence for mid-ocean ridge-continental margin interactions
(Hurst, Richard W.) 5: 267
— Time-predictable bimodal volcanism in the Coso Range, California
(Bacon, Charles R.) 2: 65

incertae sedis *see* problematic fossils

Indian Ocean—tectonophysics
sea-floor spreading: Late Cretaceous sediment sample from the Amirante Passage, western Indian Ocean
(Masson, D. G., *et al.*) 5: 264

intrusions—emplacement
rifting: Tectonic model for kimberlite emplacement in the Appalachian Plateau of Pennsylvania
(Parrish, Jay B., *et al.*) 7: 344

intrusions—laccoliths
composition: Magma immiscibility in the Shonkin Sag and Square Butte laccoliths; discussion and reply
(Nash, W. P., *et al.*) 8: 444

intrusions—occurrence
Bouguer anomalies: Gravity evidence for a shallow intrusion under Medicine Lake Volcano, California
(Finn, Carol, *et al.*) 10: 503

intrusions—plutons
distribution: Geophysical and geochemical evidence for a Hercynian magmatic arc, Maryland to Georgia
(Sinha, A. K., *et al.*) 11: 593

intrusions—stocks
crystallization: Unidirectional solidification textures and their significance in determining relative ages of intrusions at the Henderson Mine, Colorado
(Shannon, J. R., *et al.*) 6: 293
Invertebrata *see also* problematic fossils
Invertebrata—distribution
Phanerozoic: Species richness in the Phanerozoic; compensating for sampling bias
(Signor, Philip W., III) 12: 625
isotope dating *see* absolute age
isotopes *see also* absolute age; geochronology
isotopes—oxygen
O-18/O-16: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577
isotopes—sedimentary rocks
dolostone: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
isotopes—strontium
Sr-87/Sr-86: Reworking of sialic crust as represented in late Archean-age gneisses, northern Labrador
(Collerson, Kenneth D., *et al.*) 4: 202
— Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516
Japan—seismology
earthquakes: Triggering of large earthquakes by magma-chamber inflation, Izu Peninsula, Japan
(Thatcher, W., *et al.*) 12: 637
Japan—volcanology
Ata Caldera: Grain orientation and depositional ramps as flow direction indicators of a large-scale pyroclastic flow deposit in Japan
(Suzuki, Keido, *et al.*) 8: 429
joints *see under* style *under* fractures
Labrador—geochronology
Archean: Reworking of sialic crust as represented in late Archean-age gneisses, northern Labrador
(Collerson, Kenneth D., *et al.*) 4: 202
laccoliths *see under* intrusions
land use *see also* conservation
land use—soils
soil erosion: Accelerated erosion; process, problems, and prognosis
(Toy, Terrence J.) 10: 524
lava *see also* igneous rocks; magmas
lava—classification
seamounts: Diverse basalt types from Loihi Seamount, Hawaii
(Moore, J. G., *et al.*) 2: 88
Libya—stratigraphy
Ordovician: Caradocian land plant microfossils from Libya
(Gray, Jane, *et al.*) 4: 197

limestone *see also under* carbonate rocks *under* sedimentary rocks
lineation *see also* structural analysis
lineation—style
flow lines: Grain orientation and depositional ramps as flow direction indicators of a large-scale pyroclastic flow deposit in Japan
(Suzuki, Keido, *et al.*) 8: 429
magmas *see also* igneous rocks; intrusions; lava
magmas—evolution
volcanism: Time-predictable bimodal volcanism in the Coso Range, California
(Bacon, Charles R.) 2: 65
magmas—geochemistry
trace elements: Depletion of light rare-earth elements in felsic magmas
(Miller, Calvin F., *et al.*) 3: 129
— Magma immiscibility in the Shonkin Sag and Square Butte laccoliths; discussion and reply
(Nash, W. P., *et al.*) 8: 444
magmas—properties
physicochemical properties: Melt infiltration and magma evolution
(Watson, E. Bruce) 5: 236
magnetic surveys *see under* geophysical surveys *under* Arkansas; Tennessee; United States
mantle *see also under* seismology *under* Himalayas
maps *see also under* geophysical surveys *under* United States
Mars—geomorphology
drainage patterns: Drainage systems developed by sapping on Earth and Mars
(Higgins, Charles G.) 3: 147
Massachusetts—stratigraphy
Pleistocene: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246
mathematical geology *see also* automatic data processing
Mediterranean region—tectonophysics
plate tectonics: Structural sketch of the Hellenic continental margin between the western Peloponnesus and eastern Crete
(Mascle, Jean, *et al.*) 2: 113
Mediterranean Sea—geophysical surveys
seismic surveys: Structural sketch of the Hellenic continental margin between the western Peloponnesus and eastern Crete
(Mascle, Jean, *et al.*) 2: 113
Mediterranean Sea—oceanography
ocean floors: Structural sketch of the Hellenic continental margin between the western Peloponnesus and eastern Crete
(Mascle, Jean, *et al.*) 2: 113
meetings *see* symposia
melange *see under* interpretation *under* structural analysis
Mesozoic *see also under* stratigraphy *under* Mexico
metal ores—genesis
plate tectonics: Extensional habitats of rhyolite-hosted massive sulfide deposits
(Sillitoe, Richard H.) 8: 403
metamorphic rocks *see also* igneous rocks; metamorphism; metasomatism
metamorphic rocks—gneisses
orthogneiss: Reworking of sialic crust as represented in late Archean-age gneisses, northern Labrador
(Collerson, Kenneth D., *et al.*) 4: 202
metamorphic rocks—metavolcanic rocks
geochemistry: Trace-element geochemistry of Archean volcanic rocks and crustal growth in southwestern Abitibi Belt, Canada
(Capdevila, R., *et al.*) 8: 418
metamorphic rocks—mineral assemblages
complexes: Isobaric cooling of two regional metamorphic complexes related to igneous intrusions in southeastern Australia
(Vernon, R. H.) 2: 76
metamorphic rocks—mylonites
genesis: Penrose Conference report; Significance and petrogenesis of mylonitic rocks
(Tullis, Jan, *et al.*) 5: 227
properties: Seismic velocity and anisotropy in mylonites and the reflectivity of deep crustal fault zones
(Jones, Terry, *et al.*) 5: 260
metamorphic rocks—petrology
metamorphic belts: Tectonic accretion and the origin of the two major metamorphic and plutonic welts in the Canadian Cordillera
(Monger, J. W. H., *et al.*) 2: 70
prograde metamorphism: Geological evidence for post-40 m.y. B.P. large-scale northwestward displacement of part of southeastern Alaska
(Cowan, Darrel S.) 6: 309
metamorphic rocks—textures
porphyroblastic texture: Porphyroblasts and "crystallization force"; an experimental analog
(Fisher, Albert B., *et al.*) 7: 394

metamorphism—burial metamorphism
depth indicators: Time-temperature-burial significance of Devonian anthracite implies former great (≈6.5 km) depth of burial of Catskill Mountains, New York
(Friedman, Gerald M., *et al.*) 2: 93

metamorphism—P-T conditions
mineral assemblages: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Wernicke, Brian, *et al.*) 1: 3

metamorphism—retrograde metamorphism
P-T conditions: Isobaric cooling of two regional metamorphic complexes related to igneous intrusions in southeastern Australia
(Vernon, R. H.) 2: 76

metasomatism—environment
upper mantle: Instability of garnet from the mantle; glass as evidence of metasomatic melting
(Hunter, Robert H., *et al.*) 12: 617

Mexico—stratigraphy
Mesozoic: Paleomagnetic results from northeastern Mexico; evidence for large Mesozoic rotations
(Gose, Wulf A., *et al.*) 1: 50

Mexico—tectonophysics
plate tectonics: Paleomagnetic results from northeastern Mexico; evidence for large Mesozoic rotations
(Gose, Wulf A., *et al.*) 1: 50

Michigan—geophysical surveys
seismic surveys: Rift structure beneath the Michigan Basin from COCORP profiling
(Brown, L., *et al.*) 12: 645

Michigan—seismology
crust: Rift structure beneath the Michigan Basin from COCORP profiling
(Brown, L., *et al.*) 12: 645

Michigan—structural geology
fractures: Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273

mineral deposits, genesis—polymetallic ores
plate tectonics: Extensional habitats of rhyolite-hosted massive sulfide deposits
(Sillitoe, Richard H.) 8: 403

mineral deposits, genesis—uranium ores
age: Fission-track dating of sandstone-type uranium deposits
(Rosenberg, Philip E., *et al.*) 9: 481
hydrogeological controls: Preliminary model of regional Mesozoic groundwater flow and uranium deposition in the Colorado Plateau
(Sanford, Richard F.) 7: 348

mineral exploration—objectives
rift zones: Extensional habitats of rhyolite-hosted massive sulfide deposits
(Sillitoe, Richard H.) 8: 403

mineral prospecting *see* mineral exploration

minerals—orthosilicates, garnet group
phase equilibria: Instability of garnet from the mantle; glass as evidence of metasomatic melting
(Hunter, Robert H., *et al.*) 12: 617

Miocene *see also under* stratigraphy *under* Atlantic Ocean

Miocene—stratigraphy
unconformities: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577

Mississippi Valley—structural geology
tectonics: Model of the southeastern margin of the Mississippi Valley graben near Memphis, Tennessee, from interpretation of truck-magnetometer data
(Hildenbrand, T. G.) 9: 476

mollusks—biostratigraphy
Cretaceous: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433

Pleistocene: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246

Montana—petrology
intrusions: Magma immiscibility in the Shonkin Sag and Square Butte laccoliths; discussion and reply
(Nash, W. P., *et al.*) 8: 444

Montana—stratigraphy
Cretaceous: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153
Paleocene: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153
Tertiary: Land-based evidence for Tertiary climatic variations; Northern Rockies
(Thompson, Graham R., *et al.*) 8: 413

Morocco—structural geology
tectonics: Foreland thrusts and olistostromes on the pre-Sahara margin of the Variscan Orogen, Morocco
(Michard, Andre, *et al.*) 5: 253

Morocco—tectonophysics
plate tectonics: Foreland thrusts and olistostromes on the pre-Sahara margin of the Variscan Orogen, Morocco
(Michard, Andre, *et al.*) 5: 253

mud volcanoes *see also* volcanology

nappes *see under* orientation *under* folds

natural resources *see under* conservation

neotectonics *see also under* structural geology *under* Appalachians; Basin and Range Province; California

Nevada—geomorphology
weathering: Case hardening of sandstone
(Conca, James L., *et al.*) 10: 520

Nevada—stratigraphy
Cretaceous: Cretaceous magnetizations in northwestern Nevada and tectonic implications
(Russell, Branch J., *et al.*) 8: 423
Paleozoic: Mid-Paleozoic age of the Roberts thrust unsettled by new data from northern Nevada
(Ketner, Keith B., *et al.*) 6: 298

Nevada—structural geology
tectonics: Mid-Paleozoic age of the Roberts thrust unsettled by new data from northern Nevada
(Ketner, Keith B., *et al.*) 6: 298

New England—geomorphology
glacial geology: Glacial stagnation-zone retreat in New England; bedrock control
(Mulholland, J. W.) 11: 567

New England—oceanography
continental shelf: Extensional model for the subsidence of the northern United States Atlantic continental margin
(Sawyer, D. S., *et al.*) 3: 134

New Mexico—economic geology
uranium ores: Fission-track dating of sandstone-type uranium deposits
(Rosenberg, Philip E., *et al.*) 9: 481

New South Wales—petrology
metamorphism: Isobaric cooling of two regional metamorphic complexes related to igneous intrusions in southeastern Australia
(Vernon, R. H.) 2: 76

New York—petrology
metamorphism: Time-temperature-burial significance of Devonian anthracite implies former great (≈6.5 km) depth of burial of Catskill Mountains, New York
(Friedman, Gerald M., *et al.*) 2: 93

New Zealand—sedimentary petrology
sedimentation: Coconuts in Miocene turbidites in New Zealand; possible evidence for tsunami origin of some turbidity currents; discussion
(Murty, T. S.) 9: 489

New Zealand—tectonophysics
plate tectonics: Continental underthrusting beneath the Southern Alps of New Zealand; discussion and reply
(Scholz, C. H., *et al.*) 9: 489

North America *see also* Appalachians; Atlantic Coastal Plain; Canada; Great Lakes region; Great Plains; Mexico; Rocky Mountains; United States

North America—geochronology
Oligocene: Oligocene calibration of the magnetic polarity time scale
(Prothero, Donald R., *et al.*) 12: 650

North America—paleobotany
gymnosperms: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641
pteridophytes: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641

North America—petrology
metamorphic rocks: Tectonic accretion and the origin of the two major metamorphic and plutonic welts in the Canadian Cordillera
(Monger, J. W. H., *et al.*) 2: 70

North America—structural geology
tectonics: Suspect terranes and accretionary history of the Appalachian Orogen
(Williams, Harold, *et al.*) 10: 530

North America—tectonophysics
crust: Concentrically zoned pattern in the Bouguer gravity anomaly map of northeastern North America
(Klasner, J. S., *et al.*) 10: 537
plate tectonics: Cretaceous magnetizations in northwestern Nevada and tectonic implications
(Russell, Branch J., *et al.*) 8: 423
— Geological evidence for post-40 m.y. B.P. large-scale northwestward displacement of part of southeastern Alaska
(Cowan, Darrel S.) 6: 309
— Plate-tectonics model for Proterozoic continental accretion in the southwestern United States
(Condie, Kent C.) 1: 37
— Tripie-junction instability as cause for late Cenozoic extension and fragmentation of the western United States
(Ingersoll, Raymond V.) 12: 621

Northern Hemisphere *see also* Arctic Ocean; Asia; Atlantic Ocean; Europe; North America; Pacific Ocean

Northwest Territories—geochronology
Pleistocene: Comparison of uranium-series, radiocarbon, and amino acid data from marine Mollusca, Baffin Island, Arctic Canada; discussion and reply
(Brigham, Julie K., *et al.*) 4: 215
Quaternary: Comparison of uranium-series, radiocarbon, and amino acid data from marine molluscs, Baffin Island, Arctic Canada; discussion and reply
(Gascoyne, M., *et al.*) 8: 438

Norway—oceanography
continental slope: Origin of seaward-dipping reflectors in oceanic crust off the Norwegian margin by "subaerial sea-floor spreading"
(Mutter, John C., *et al.*) 7: 353

Norway—seismology
crust: Origin of seaward-dipping reflectors in oceanic crust off the Norwegian margin by "subaerial sea-floor spreading"
(Mutter, John C., *et al.*) 7: 353

Nova Scotia—stratigraphy
Holocene: Micropaleontological documentation for early Holocene fall of relative sea level on the Atlantic coast of Nova Scotia
(Scott, David B., *et al.*) 5: 278

ocean circulation *see also under* oceanography *under* Atlantic Ocean
ocean floors *see also under* oceanography *under* Mediterranean Sea; Pacific Ocean

Oligocene *see also under* geochronology *under* Great Plains; North America
olistostromes *see under* soft sediment deformation *under* sedimentary structures

Oman—sedimentary petrology
reefs: "Oman exotics"; oceanic carbonate build-ups associated with the early stages of continental rifting
(Searle, M. P., *et al.*) 1: 43

Oman—tectonophysics
plate tectonics: "Oman exotics"; oceanic carbonate build-ups associated with the early stages of continental rifting
(Searle, M. P., *et al.*) 1: 43

Ontario—structural geology
fractures: Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273

ophiolite *see under* ultramafics *under* igneous rocks

Ordovician *see also under* geochronology *under* Scotland; *see also under* stratigraphy *under* Appalachians; Libya

Oregon—sedimentary petrology
sedimentary rocks: Provenance of Eocene graywackes of the Flournoy Formation near Agness, Oregon; a geochemical approach; discussion
(Ahmad, Raisuddin) 6: 333

Oregon—stratigraphy
Permian: Biostratigraphy and structural setting of the Permian Coyote Butte Formation of central Oregon
(Wardlaw, Bruce R., *et al.*) 1: 13

Oregon—structural geology
tectonics: Late Cenozoic deformation and volcanism in the Blue Mountains of central Oregon; microplate interactions?
(Robyn, Thomas L., *et al.*) 11: 572

Oregon—tectonophysics
plate tectonics: Late Cenozoic deformation and volcanism in the Blue Mountains of central Oregon; microplate interactions?
(Robyn, Thomas L., *et al.*) 11: 572

organic materials—amino acids
geochemistry: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124

orogeny—absolute age
Caledonian Orogeny: Age and origin of Ballantrae ophiolite and its significance to the Caledonian Orogeny and the Ordovician time scale; discussion and reply
(Barrett, T. J., *et al.*) 6: 331

orogeny—evolution
Appalachian Phase: Penrose Conference report; Timing of orogenic events in the Appalachian-Caledonian system
(Thomas, William A., *et al.*) 9: 485
— Suspect terranes and accretionary history of the Appalachian Orogen
(Williams, Harold, *et al.*) 10: 530
Cordilleran Orogeny: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Wernicke, Brian, *et al.*) 1: 3
Hercynian Orogeny: Foreland thrusts and olistostromes on the pre-Sahara margin of the Variscan Orogen, Morocco
(Michard, Andre, *et al.*) 5: 253
— Geophysical and geochemical evidence for a Hercynian magmatic arc, Maryland to Georgia
(Sinha, A. K., *et al.*) 11: 593

orogeny—mechanism
Grenvillian Orogeny: Coal Creek Serpentinite, Llano Uplift, Texas; a fragment of an incomplete Precambrian ophiolite; discussion and reply
(Thomas, M. D., *et al.*) 8: 440

ostracods—biostratigraphy
Pleistocene: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246

oxygen—geochemistry
atmosphere: Oxygen in the Precambrian atmosphere; an evaluation of the geological evidence
(Clemmey, Harry, *et al.*) 3: 141

oxygen—isotopes
O-18/O-16: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
— Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577

Pacific Coast—tectonophysics
plate tectonics: Evolution and thickness of the lithosphere beneath coastal California
(Zandt, George, *et al.*) 7: 376

Pacific Ocean *see also* Polynesia

Pacific Ocean—environmental geology
geologic hazards: Earthquake-induced sediment failures on a 0.25° slope, Klamath River delta, California
(Field, Michael E., *et al.*) 10: 542

Pacific Ocean—oceanography
ocean floors: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433

Pacific Ocean—petrology
igneous rocks: Diverse basalt types from Loihi Seamount, Hawaii
(Moore, J. G., *et al.*) 2: 88

Pacific Ocean—tectonophysics
plate tectonics: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433

Paleocene *see also under* stratigraphy *under* Alaska; Montana

paleoclimatology—Cretaceous
global: Atmospheric circulation during warm geologic periods; is the equator-to-pole surface-temperature gradient the controlling factor?
(Barron, E. J., *et al.*) 12: 633

paleoclimatology—Miocene
global: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577

paleoclimatology—Neogene
global: Worldwide continental denudation and climatic deterioration during the late Tertiary; evidence from deep-sea sediments
(Donnelly, Thomas W.) 9: 451

paleoclimatology—Pleistocene
Massachusetts: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246

paleoclimatology—Tertiary
Rocky Mountains: Land-based evidence for Tertiary climatic variations; Northern Rockies
(Thompson, Graham R., *et al.*) 8: 413

paleoecology—algae
Phanerozoic: Stromatolite decline; a reconsideration
(Pratt, Brian R.) 10: 512

paleoecology—Plantae
Carboniferous: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641

paleoecology—Pleistocene
Massachusetts: Stratigraphy, structure, absolute age, and paleontology of the upper Pleistocene deposits at Sankaty Head, Nantucket Island, Massachusetts
(Oldale, R. N., *et al.*) 5: 246

Paleogene *see also under* stratigraphy *under* Atlantic Ocean

paleogeography—Cretaceous
Arizona: Tectonic models for Early Cretaceous rifting in southeastern Arizona
(Bilodeau, William L.) 9: 466
global: Atmospheric circulation during warm geologic periods; is the equator-to-pole surface-temperature gradient the controlling factor?
(Barron, E. J., *et al.*) 12: 633

paleogeography—interpretation
biogeography: A case for two late Proterozoic-earliest Cambrian faunal province loci
(McMenamin, Mark A. S.) 6: 290

paleogeography—Mesozoic
Colorado Plateau: Preliminary model of regional Mesozoic groundwater flow and uranium deposition in the Colorado Plateau
(Sanford, Richard F.) 7: 348

paleogeography—Ordovician
Appalachians: Analogous tectonic evolution of the Ordovician foredeeps, Southern and Central Appalachians
(Shanmugam, G., *et al.*) 11: 562

paleogeography—Paleocene
Alaska: Limits to northward drift of the Paleocene Cantwell Formation, central Alaska
(Hillhouse, John W., *et al.*) 10: 552

paleomagnetism—applications
faults: Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussions and reply
(Donovan, R. Nowell, *et al.*) 11: 604

paleomagnetism—Cretaceous
Nevada: Cretaceous magnetizations in northwestern Nevada and tectonic implications
(Russell, Branch J., *et al.*) 8: 423

paleomagnetism—Devonian
Scotland: Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussion and reply
(Winchester, J. A., *et al.*) 9: 487

paleomagnetism—interpretation
magnetic anomalies: Along-strike amplitude variations of oceanic magnetic stripes; are they related to low-temperature hydrothermal circulation?
(Whitmarsh, R. B.) 9: 461
remagnetization: Paleomagnetic study of some Cretaceous and Tertiary sedimentary rocks of the Klamath Mountains province, California
(Mankinen, Edward A., *et al.*) 2: 82

paleomagnetism—Mesozoic
Mexico: Paleomagnetic results from northeastern Mexico; evidence for large Mesozoic rotations
(Gose, Wulf A., *et al.*) 1: 50

paleomagnetism—Miocene
Philippine Islands: Geologic and paleomagnetic evidence for a possible Miocene collision in western Panay, central Philippines
(McCabe, Robert, *et al.*) 6: 325

paleomagnetism—Oligocene
Great Plains: Oligocene calibration of the magnetic polarity time scale
(Prothero, Donald R., *et al.*) 12: 650

paleomagnetism—Paleocene
Alaska: Limits to northward drift of the Paleocene Cantwell Formation, central Alaska
(Hillhouse, John W., *et al.*) 10: 552

paleomagnetism—Paleogene
Atlantic Ocean: Late Eocene-Oligocene magnetostratigraphy and biostratigraphy at South Atlantic DSDP Site 522
(Poore, Richard Z., *et al.*) 10: 508

paleomagnetism—reversals
magnetostratigraphy: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153

paleontology—symposia
extinction: Impacts and evolution conference; discussion and reply
(Hsu, Kenneth J., *et al.*) 10: 557
— Impacts and evolution conference; report and comments
(Silver, L. T., *et al.*) 3: 126

Paleozoic *see also under* stratigraphy *under* Nevada

palynomorphs—biostratigraphy
Ordovician: Caradocian land plant microfossils from Libya
(Gray, Jane, *et al.*) 4: 197

palynomorphs—miospores
Cretaceous: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153
Paleocene: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153
Permian: Geological implications of recycled Permian and Triassic palynomorphs in Tertiary rocks of Seymour Island, Antarctic Peninsula
(Askin, Rosemary A., *et al.*) 10: 547

Pennsylvania—petrology
intrusions: Tectonic model for kimberlite emplacement in the Appalachian Plateau of Pennsylvania
(Parrish, Jay B., *et al.*) 7: 344
metasomatism: Instability of garnet from the mantle; glass as evidence of metasomatic melting
(Hunter, Robert H., *et al.*) 12: 617

Permian *see also under* stratigraphy *under* Antarctica; Oregon; Utah

Phanerozoic—geochemistry
isotopes: Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516

Phanerozoic—paleobotany
algae: Stromatolite decline; a reconsideration
(Pratt, Brian R.) 10: 512

Phanerozoic—paleontology
Invertebrata: Species richness in the Phanerozoic; compensating for sampling bias
(Signor, Philip W., III) 12: 625

Phanerozoic—sedimentary petrology
sedimentary rocks: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
— Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites; discussions and reply
(Zenger, Donald H., *et al.*) 12: 662

phase equilibria—mineral assemblages
interpretation: Instability of garnet from the mantle; glass as evidence of metasomatic melting
(Hunter, Robert H., *et al.*) 12: 617

Philippine Islands—tectonophysics
plate tectonics: Geologic and paleomagnetic evidence for a possible Miocene collision in western Panay, central Philippines
(McCabe, Robert, *et al.*) 6: 325

planetology *see also* Mars

Plantae *see also* algae; angiosperms; gymnosperms; palynomorphs; problematic fossils; Protista; pteridophytes

Plantae—floral studies
Carboniferous: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641

plate tectonics *see also under* tectonophysics *under* Appalachians; Arizona; Asia; Atlantic region; California; Far East; Mediterranean region; Mexico; Morocco; New Zealand; North America; Oman; Oregon; Pacific Coast; Pacific Ocean; Philippine Islands; Scotland; Texas; Western U.S.

plate tectonics—plate geometry
subduction: Geometry of subducted plates and island arcs viewed as a buckling problem
(Bayly, Brian) 12: 629

plate tectonics—rifting
metallogeny: Extensional habitats of rhyolite-hosted massive sulfide deposits
(Sillitoe, Richard H.) 8: 403

Pleistocene *see also under* geochronology *under* Alaska; California; Northwest Territories; *see also under* stratigraphy *under* Massachusetts

plutons *see under* intrusions

pollution *see also* waste disposal

polymetallic ores—genesis
plate tectonics: Extensional habitats of rhyolite-hosted massive sulfide deposits
(Sillitoe, Richard H.) 8: 403

Polynesia—petrology
volcanism: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433

Precambrian—geochemistry
oxygen: Oxygen in the Precambrian atmosphere; an evaluation of the geological evidence
(Clemmey, Harry, *et al.*) 3: 141

Precambrian—sedimentary petrology
sedimentary rocks: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
— Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites; discussions and reply
(Zenger, Donald H., *et al.*) 12: 662

problematic fossils—problematic microfossils
biogeography: A case for two late Proterozoic-earliest Cambrian faunal province loci
(McMenamin, Mark A. S.) 6: 290

Proterozoic *see also* Precambrian

Protista—biostratigraphy
Miocene: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577

Protozoa *see* Protista

pteridophytes—floral studies
Carboniferous: Changes in dominance patterns in Upper Carboniferous plant fossil assemblages
(Pfefferkorn, Hermann W., *et al.*) 12: 641

pteridophytes—occurrence
Ordovician: Caradocian land plant microfossils from Libya
(Gray, Jane, *et al.*) 4: 197

pyroclastics *see under* igneous rocks

quartz *see under* fission-track dating *under* geochronology

Quaternary *see also under* geochronology *under* California; Northwest Territories

radioactive dating *see* absolute age

radiolarians—biostratigraphy
Miocene: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577

rare earths—abundance
magmas: Depletion of light rare-earth elements in felsic magmas
(Miller, Calvin F., *et al.*) 3: 129

reclamation *see also* conservation; land use

reefs *see also under* sedimentary petrology *under* Oman

regional geology *see* areal geology under the appropriate area term

remote sensing *see also* geophysical methods

reptiles—biostratigraphy
Cretaceous: Upper Cretaceous-Paleocene biostratigraphy and magnetostratigraphy, Hell Creek and Tullock formations, northeastern Montana
(Archibald, J. David, *et al.*) 3: 153

Rocky Mountains—stratigraphy
Tertiary: Land-based evidence for Tertiary climatic variations; Northern Rockies
(Thompson, Graham R., *et al.*) 8: 413

Scotland—geochronology
Ordovician: Age and origin of Ballantrae ophiolite and its significance to the Caledonian Orogeny and the Ordovician time scale; discussion and reply
(Barrett, T. J., *et al.*) 6: 331

Scotland—structural geology
faults: Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussions and reply
(Donovan, R. Nowell, *et al.*) 11: 604
tectonics: Paleomagnetic evidence for a large (≈2,000 km) sinistral offset along the Great Glen Fault during Carboniferous time; discussion and reply
(Winchester, J. A., *et al.*) 9: 487

Scotland—tectonophysics
plate tectonics: Age and origin of Ballantrae ophiolite and its significance to the Caledonian Orogeny and the Ordovician time scale; discussion and reply
(Barrett, T. J., *et al.*) 6: 331

sea-floor spreading *see also under* tectonophysics *under* Arctic Ocean; Atlantic Ocean; Indian Ocean

sea water—geochemistry
isotopes: Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516

sedimentary rocks *see also* sedimentary structures; sedimentation; sediments

sedimentary rocks—carbonate rocks
dolostone: Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites
(Tucker, Maurice E.) 1: 7
— Precambrian dolomites; petrographic and isotopic evidence that they differ from Phanerozoic dolomites; discussions and reply
(Zenger, Donald H., *et al.*) 12: 662
limestone: "Oman exotics"; oceanic carbonate build-ups associated with the early stages of continental rifting
(Searle, M. P., *et al.*) 1: 43

sedimentary rocks—clastic rocks
graywacke: Provenance of Eocene graywackes of the Flournoy Formation near Agness, Oregon; a geochemical approach; discussion
(Ahmad, Raisuddin) 6: 333
turbidite: Coconuts in Miocene turbidites in New Zealand; possible evidence for tsunami origin of some turbidity currents; discussion
(Murty, T. S.) 9: 489
— Eustatic control of turbidites and winnowed turbidites
(Shanmugam, G., *et al.*) 5: 231

sedimentary rocks—diagenesis
controls: Influence of rock composition on kinetics of silica phase changes in the Monterey Formation, Santa Barbara area, California
(Isaacs, Caroline M.) 6: 304

sedimentary rocks—geochemistry
isotopes: Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516

sedimentary rocks—lithofacies
laminite: Green River laminites; does the playa-lake model really invalidate the stratified-lake model?
(Boyer, Bruce W.) 6: 321

sedimentary structures *see also* sedimentary rocks; sediments

sedimentary structures—soft sediment deformation
olistostromes: Foreland thrusts and olistostromes on the pre-Sahara margin of the Variscan Orogen, Morocco
(Michard, André, *et al.*) 5: 253

sedimentation—controls
tectonic controls: Analogous tectonic evolution of the Ordovician foredeeps, Southern and Central Appalachians
(Shanmugam, G., *et al.*) 11: 562
— "Oman exotics"; oceanic carbonate build-ups associated with the early stages of continental rifting
(Searle, M. P., *et al.*) 1: 43
— Probable sequential arrangement of depositional systems on cratons
(Klein, George deVries) 1: 17

sedimentation—cyclic processes
deep-sea sedimentation: Blake Plateau; control of Miocene sedimentation patterns by large-scale shifts of the Gulf Stream axis
(Pinet, Paul R., *et al.*) 5: 257
— Eustatic control of turbidites and winnowed turbidites
(Shanmugam, G., *et al.*) 5: 231

sedimentation—deposition
glacial sedimentation: Glacial stagnation-zone retreat in New England; bedrock control
(Mulholland, J. W.) 11: 567

sedimentation—diagenesis
fresh-water environment: SEM observations on the replacement of Bahaman aragonitic mud by calcite
(Steinen, Randolph P.) 9: 471
lacustrine environment: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124

sedimentation—environment
lacustrine environment: Green River laminites; does the playa-lake model really invalidate the stratified-lake model?
(Boyer, Bruce W.) 6: 321
terrestrial environment: Land-based evidence for Tertiary climatic variations; Northern Rockies
(Thompson, Graham R., *et al.*) 8: 413

sedimentation—processes
deep-sea sedimentation: Widespread Miocene deep-sea hiatuses; coincidence with periods of global cooling
(Barron, John A., *et al.*) 11: 577
marine sedimentation: Penrose Conference report; Controls on carbonate platforms and basin systems development
(Wilson, James Lee) 12: 659

sedimentation—provenance
paleocurrents: Provenance of Eocene graywackes of the Flournoy Formation near Agness, Oregon; a geochemical approach; discussion
(Ahmad, Raisuddin) 6: 333

sedimentation—sedimentation rates
detrital sedimentation: Worldwide continental denudation and climatic deterioration during the late Tertiary; evidence from deep-sea sediments
(Donnelly, Thomas W.) 9: 451

sedimentation—transport
turbidity currents: Coconuts in Miocene turbidites in New Zealand; possible evidence for tsunami origin of some turbidity currents; discussion
(Murty, T. S.) 9: 489
— Morphology of a submarine slide, Kitimat Arm, British Columbia
(Prior, David B., *et al.*) 11: 588
— Reconnaissance in DSRV Alvin of a "fluvial-like" meander system in Wilmington Canyon and slump features in South Wilmington Canyon
(Stubblefield, William L., *et al.*) 1: 31

sediments *see also* sedimentary rocks; sedimentary structures; sedimentation

sediments—carbonate sediments
diagenesis: SEM observations on the replacement of Bahaman aragonitic mud by calcite
(Steinen, Randolph P.) 9: 471

sediments—clastic sediments
outwash: Glacial stagnation-zone retreat in New England; bedrock control
(Mulholland, J. W.) 11: 567

sediments—geochemistry
organic materials: Geochemistry of amino acids in sediments from Clear Lake, California; discussion and reply
(Dungworth, G., *et al.*) 3: 124

sediments—marine sediments
geochemistry: Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516

seismic surveys *see under* geophysical surveys *under* Mediterranean Sea; Michigan

seismology—crust
velocity structure: Origin of seaward-dipping reflectors in oceanic crust off the Norwegian margin by "subaerial sea-floor spreading"
(Mutter, John C., *et al.*) 7: 353
— Rift structure beneath the Michigan Basin from COCORP profiling
(Brown, L., *et al.*) 12: 645

seismology—earthquakes
causes: Triggering of large earthquakes by magma-chamber inflation, Izu Peninsula, Japan
(Thatcher, W., *et al.*) 12: 637
focal mechanism: Seismicity of the central Gulf of Mexico
(Frohlich, Cliff) 2: 103

seismology—experimental studies
anisotropic materials: Seismic velocity and anisotropy in mylonites and the reflectivity of deep crustal fault zones
(Jones, Terry, *et al.*) 5: 260

seismology—interior
velocity structure: Velocities and propagation characteristics of Pn and Sn beneath the Himalayan Arc and Tibetan Plateau; possible evidence for underthrusting of Indian continental lithosphere beneath Tibet
(Barazangi, Muawia, *et al.*) 4: 179

shore features *see under* geomorphology

slope stability *see also* geomorphology; *see also under* engineering geology *under* British Columbia; California

soils—soil erosion
rates: Accelerated erosion; process, problems, and prognosis
(Toy, Terrence J.) 10: 524

soils—surveys
Western U.S.: Clay mineralogy of weathering rinds and possible implications concerning the sources of clay minerals in soils
(Colman, Steven M.) 7: 370

South Carolina—engineering geology
earthquakes: Internally consistent pattern of seismicity near Charleston, South Carolina
(Talwani, Pradeep) 12: 654
— Large-scale patterns of seismicity before and after the 1886 South Carolina earthquake
(Seeber, L., *et al.*) 7: 382

South Carolina—structural geology
tectonics: Master decollement root zone beneath the Southern Appalachians and crustal balance
(Iverson, William P., *et al.*) 5: 241

Southern Hemisphere *see also* Antarctica; Atlantic Ocean; Indian Ocean; Pacific Ocean

Southwestern U.S.—tectonophysics
crust: Plate-tectonics model for Proterozoic continental accretion in the southwestern United States
(Condie, Kent C.) 1: 37

Spain—structural geology
tectonics: Emplacement of a fold-nappe, Betic Orogen, southern Spain
(Platt, J. P.) 2: 97

springs *see also* ground water

stromatolites *see under* algae

strontium—isotopes
Sr-87/Sr-86: Reworking of sialic crust as represented in late Archean-age gneisses, northern Labrador
(Collerson, Kenneth D., *et al.*) 4: 202
— Variation of seawater $^{87}Sr/^{86}Sr$ throughout Phanerozoic time
(Burke, W. H., *et al.*) 10: 516

structural analysis *see also* folds; lineation

structural analysis—faults
interference patterns: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Cress, Leland D., *et al.*) 8: 442

structural analysis—fractures
joints: Intensity of systematic joints; methods and application; discussion and reply
(Narr, W., *et al.*) 2: 61
— Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273

structural analysis—interpretation
fault zones: Joint spacing as a method of locating faults; discussions and reply
(Narr, W., *et al.*) 2: 61
— Joint spacing as a method of locating faults; discussion
(Shepherd, J., *et al.*) 5: 282
melange: Biostratigraphy and structural setting of the Permian Coyote Butte Formation of central Oregon
(Wardlaw, Bruce R., *et al.*) 1: 13
tectonic wedges: "Oman exotics"; oceanic carbonate build-ups associated with the early stages of continental rifting
(Searle, M. P., *et al.*) 1: 43

structural petrology *see* structural analysis

survey organizations—general
BRGM: Cross-database, cross-national geologic indexing; problems and solutions
(Rassam, G. N., *et al.*) 11: 600

syenites *see under* igneous rocks

symposia—paleontology
paleoecology: Impacts and evolution conference; discussion and reply
(Hsu, Kenneth J., *et al.*) 10: 557
— Impacts and evolution conference; report and comments
(Silver, L. T., *et al.*) 3: 126

symposia—petrology
metamorphic rocks: Penrose Conference report; Significance and petrogenesis of mylonitic rocks
(Tullis, Jan, *et al.*) 5: 227

symposia—sedimentary petrology
sedimentation: Penrose Conference report; Controls on carbonate platforms and basin systems development
(Wilson, James Lee) 12: 659

symposia—structural geology
orogeny: Penrose Conference report; Timing of orogenic events in the Appalachian-Caledonian system
(Thomas, William A., *et al.*) 9: 485

symposia—tectonophysics
core: Conference report: Earth's core; its structure, evolution, and magnetic field
(Verosub, Kenneth L.) 7: 392

tectonics *see also* faults; folds; orogeny; structural analysis; *see also under* structural geology *under* Alaska; Appalachians; Basin and Range Province; California; Georgia; Idaho; Mississippi Valley; Morocco; Nevada; North America; Oregon; Scotland; South Carolina; Spain; Utah; Western U.S.

Tennessee—geophysical surveys
magnetic surveys: Model of the southeastern margin of the Mississippi Valley graben near Memphis, Tennessee, from interpretation of truck-magnetometer data
(Hildenbrand, T. G.) 9: 476

Tertiary *see also under* stratigraphy *under* Antarctica; Montana; Rocky Mountains

Texas—tectonophysics
plate tectonics: Coal Creek Serpentinite, Llano Uplift, Texas; a fragment of an incomplete Precambrian ophiolite; discussion and reply
(Thomas, M. D., *et al.*) 8: 440

thrust faults *see under* displacements *under* faults

trace elements *see under* geochemistry *under* Canadian Shield; magmas

Triassic *see also under* stratigraphy *under* Antarctica; Utah

underground water *see* ground water

United Kingdom *see also* Scotland

United States *see also* the individual states and regions

United States—geophysical surveys
magnetic surveys: Long-wavelength aeromagnetic anomaly map of the conterminous United States
(Sexton, John L., *et al.*) 7: 364
maps: Long-wavelength aeromagnetic anomaly map of the conterminous United States
(Sexton, John L., *et al.*) 7: 364

uranium ores *see also under* economic geology *under* Colorado Plateau; New Mexico

Utah—stratigraphy
Permian: Permian-Triassic unconformity in the Terrace Mountains, northwestern Utah
(Paull, Rachel K., *et al.*) 11: 582
Triassic: Permian-Triassic unconformity in the Terrace Mountains, northwestern Utah
(Paull, Rachel K., *et al.*) 11: 582

Utah—structural geology
faults: Number and orientation of fault sets in the field and in experiments
(Aydin, Atilla, *et al.*) 2: 107
tectonics: Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Wernicke, Brian, *et al.*) 1: 3
— Mesozoic evolution, hinterland of the Sevier orogenic belt; discussion and reply
(Cress, Leland D., *et al.*) 8: 442

Vertebrata *see also* problematic fossils

volcanic rocks *see under* igneous rocks

volcanism *see under* volcanology

volcanoes *see under* volcanology

volcanology—volcanism
hot spots: Late Cretaceous and Eocene volcanism in the southern Line Islands and implications for hotspot theory
(Haggerty, Janet A., *et al.*) 8: 433
periodicity: Late Cenozoic deformation and volcanism in the Blue Mountains of central Oregon; microplate interactions?
(Robyn, Thomas L., *et al.*) 11: 572
— Time-predictable bimodal volcanism in the Coso Range, California
(Bacon, Charles R.) 2: 65
— Trace-element geochemistry of Archean volcanic rocks and crustal growth in southwestern Abitibi Belt, Canada
(Capdevila, R., *et al.*) 8: 418
processes: Petrogenesis of the Conejo volcanic suite, southern California; evidence for mid-ocean ridge-continental margin interactions
(Hurst, Richard W.) 5: 267

volcanology—volcanoes
Aira Caldera: Grain orientation and depositional ramps as flow direction indicators of a large-scale pyroclastic flow deposit in Japan
(Suzuki, Keido, *et al.*) 8: 429

waste disposal—radioactive waste
storage: Problems in determination of the water content of rock-salt samples and its significance in nuclear-waste storage siting; discussion
(Kopp, Otto C.) 6: 330

water *see also* ground water

weathering *see also under* geomorphology *under* Nevada; *see also under* sedimentary petrology *under* Western U.S.

weathering—minerals
aluminosilicates: Parabolic dissolution kinetics of silicate minerals; an artifact of nonequilibrium precipitation processes?
(Holdren, George R., Jr., *et al.*) 4: 186
clay minerals: Clay mineralogy of weathering rinds and possible implications concerning the sources of clay minerals in soils
(Colman, Steven M.) 7: 370

weathering—sedimentary rocks
sandstone: Case hardening of sandstone
(Conca, James L., *et al.*) 10: 520

West Indies *see also* Bahamas

Western Hemisphere *see also* Atlantic Ocean; North America; Pacific Ocean

Western U.S.—sedimentary petrology
sedimentation: Green River laminites; does the playa-lake model really invalidate the stratified-lake model?
(Boyer, Bruce W.) 6: 321
weathering: Clay mineralogy of weathering rinds and possible implications concerning the sources of clay minerals in soils
(Colman, Steven M.) 7: 370

Western U.S.—structural geology
tectonics: Triple-junction instability as cause for late Cenozoic extension and fragmentation of the western United States
(Ingersoll, Raymond V.) 12: 621

Western U.S.—tectonophysics
plate tectonics: Triple-junction instability as cause for late Cenozoic extension and fragmentation of the western United States
(Ingersoll, Raymond V.) 12: 621

Wisconsin—structural geology
fractures: Regional jointing in the northern Michigan Basin
(Holst, Timothy B.) 5: 273

Geology Author Index
Volume 10

Adams, John E. 4: 186
Ahmad, Raisuddin 6: 333
Allis, R. G. 9: 489
Allmendinger, Richard W. 1: 3
Allmendinger, Richard W. 8: 442
Almasco, Jose 6: 325
Alt, David 8: 413
Andrews, J. T. 4: 215
Andrews, J. T. 8: 438
Aoki, Y. 7: 339
Archibald, J. David 3: 153
Armbruster, J. G. 7: 382
Armijo, R. 12: 611
Askin, Rosemary A. 10: 547
Aydin, Atilla 2: 107
Bacon, Charles R. 2: 65
Badham, Nick 3: 141
Barazangi, Muawia 4: 179
Barrett, T. J. 6: 331
Barron, E. J. 12: 633
Barron, John A. 11: 577
Bayly, Brian 12: 629
Beck, Myrl E. 8: 423
Belcher, Robert C. 1: 50
Belderson, R. H. 9: 491
Belknap, D. F. 5: 246
Benziane, Fouad 5: 253
Bilodeau, William L. 9: 466
Blackwelder, B. W. 5: 246
Bluck, B. J. 6: 331
Blunt, David J. 3: 124
Bohannon, Robert G. 7: 358
Bollinger, G. A. 7: 382
Bornhold, Brian D. 11: 588
Boucot, A. J. 4: 197
Boyer, Bruce W. 6: 321
Braile, Lawrence W. 7: 364
Brigham, Julie K. 4: 215
Brown, L. 12: 645
Bryant, William R. 11: 588
Burchfiel, B. Clark 10: 499
Burke, W. H. 10: 516
Burmester, Russell F. 8: 423
Butler, Robert F. 3: 153
Capdevila, R. 8: 418
Carlson, R. L. 4: 191
Carten, R. B. 6: 293
Clague, D. A. 2: 88
Clemens, William A. 3: 153
Clemmey, Harry 3: 141
Cobbold, P. 12: 611
Cole, Kenneth L. 11: 597
Coleman, James M. 11: 588
Collerson, Kenneth D. 4: 202
Colman, Steven M. 7: 370
Conca, James L. 10: 520
Condie, Kent C. 1: 37
Cowan, Darrel S. 6: 309
Creasey, J. W. 5: 282
Cress, Leland D. 8: 442
Cronin, T. M. 5: 246
D'Argenio, Bruno 12: 659
Denham, Charles R. 12: 650
Denison, R. E. 10: 516
Diegor, Wilfredo 6: 325
Dingus, Lowell 3: 153
Donnelly, Thomas W. 9: 451
Donovan, R. Nowell 11: 604
Drake, Charles L. 3: 126
Drake, Charles L. 10: 557
Dungworth, G. 3: 124
Dutro, J. Thomas, Jr. 1: 13
Edwards, Brain D. 10: 542
Ehlers, Ernest G. 7: 394
Elliot, David H. 10: 547
Farmer, Harlow G. 12: 650
Field, Michael E. 10: 542
Fields, Robert W. 8: 413
Finn, Carol 10: 503
Fisher, Albert B. 7: 394
Forde, E. B. 1: 31
Friedman, Gerald M. 2: 93
Frohlich, Cliff 2: 103
Furlong, Kevin P. 7: 376
Gardner, James V. 10: 542
Garrison, James R., Jr. 8: 440
Gascoyne, M. 8: 438
Geraghty, E. P. 6: 293
Goodwin, A. M. 8: 418
Gorton, M. P. 8: 418
Gose, Wulf A. 1: 50
Graham, G. M. 1: 43
Gravesteijn, J. 11: 600
Gray, Jane 4: 197

Gromme, C. Sherman 10: 552
Guth, Peter L. 10: 499
Hagans, Danny K. 7: 387
Haggerty, Janet A. 8: 433
Halliday, A. N. 6: 331
Hanson, Gilbert N. 4: 202
Hatcher, Robert D., Jr. 10: 530
Henyey, T. L. 4: 209
Hetherington, E. A. 10: 516
Higgins, Charles G. 3: 147
Hildenbrand, T. G. 9: 476
Hillhouse, John W. 10: 552
Hinze, William J. 7: 364
Holdren, George R., Jr. 4: 186
Hollard, Henri 5: 253
Holst, Timothy B. 5: 273
Hooper, Robert L. 9: 481
Hoover, James D. 11: 572
Howell, David G. 7: 358
Hsu, Kenneth J. 10: 557
Hunter, Robert H. 12: 617
Hurst, Richard W. 5: 267
Ingersoll, Raymond V. 12: 621
Irwin, William P. 2: 82
Isaacs, Caroline M. 6: 304
Iverson, William P. 5: 241
Jenkyns, H. C. 6: 331
Jennings, Anne E. 10: 542
Jensen, L. 12: 645
Jones, Terry 5: 260
Jongsma, Derk 2: 113
Jordan, Teresa E. 1: 3
Jordan, Teresa E. 8: 442
Kaufman, S. 12: 645
Keller, Gerta 11: 577
Kelsey, Harvey M. 7: 387
Kendrick, G. C. 8: 444
Kenyon, N. H. 9: 491
Kerr, Andrew 4: 202
Ketner, Keith B. 6: 298
Kidd, R. B. 5: 264
Klasner, J. S. 10: 537
Klein, George deVries 1: 17
Koepnick, R. B. 10: 516
Kopp, Otto C. 6: 330
Kvenvolden, Keith A. 3: 124
La Brecque, John L. 10: 508
Lambert, D. N. 1: 31
Lash, G. G. 11: 562
Lavin, Peter M. 7: 344
Le Dain, A. Y. 12: 611
Le Quellec, Patrick 2: 113
Leggett, J. K. 6: 331
Leite, Osmario 2: 113
Lindsay, Everett H. 3: 153
Mankinen, Edward A. 2: 82
Mascle, Jean 2: 113
Massa, Dominique 4: 197

Masson, D. G. 5: 264
Mayer, Larry 11: 597
McCabe, Robert 6: 325
McGregor, B. A. 9: 491
McGregor, Bonnie A. 1: 27
McGregor, Bonnie A. 1: 31
McLaren, Digby J. 3: 126
McMenamin, Mark A. S. 6: 290
Medioli, Franco S. 5: 278
Merrill, G. F. 1: 31
Meyerhoff, A. A. 11: 604
Michard, Andre 5: 253
Miller, Calvin F. 3: 129
Miller, G. H. 4: 215
Miller, G. H. 8: 438
Mittlefehldt, David W. 3: 129
Moiola, R. J. 5: 231
Monger, J. W. H. 2: 70
Moore, J. G. 2: 88
Muhs, D. R. 1: 23
Mulholland, J. W. 11: 567
Murty, T. S. 9: 489
Mutter, John C. 7: 353
Narr, W. 2: 61
Narr, W. 2: 61
Nash, W. P. 8: 444
Nelson, H. F. 10: 516
Nestell, Merlynd K. 1: 13
Ni, James 4: 179
Normark, W. R. 2: 88
Nur, Amos 5: 260
Oldale, R. N. 5: 246
Oliver, J. 12: 645
Otto, J. B. 10: 516
Parnell, John 11: 604
Parrish, Jay B. 7: 344
Paull, Rachel K. 11: 582
Paull, Richard A. 11: 582
Peltzer, G. 12: 611
Percival, Stephen F., Jr. 10: 508
Pfefferkorn, Hermann W. 12: 641
Pinet, Paul R. 5: 257
Platt, J. P. 2: 97
Plescia, J. B. 4: 209
Pohn, Howard A. 2: 61
Poore, Richard Z. 10: 508
Popenoe, Peter 5: 257
Pratt, Brian R. 10: 512
Premoli Silva, Isabella 8: 433
Price, R. A. 2: 70
Prior, David B. 11: 588
Prothero, Donald R. 12: 650
Rassam, G. N. 11: 600
Reches, Ze'ev 2: 107
Ricketts, B. D. 12: 662
Rixon, L. K. 5: 282
Roberts, D. G. 5: 264
Roberts, David G. 8: 408
Robertson, A. H. F. 6: 331
Robyn, Thomas L. 11: 572
Rosenberg, Philip E. 9: 481
Rossman, George R. 10: 520
Russell, Branch J. 8: 423
Ryan, W. B. F. 9: 491
Ryan, William B. F. 1: 27
Rymer, Michael J. 6: 314
Saleeby, Jason B. 3: 162
Sanders, John E. 2: 93

Sanford, Richard F. 7: 348
Savage, J. C. 12: 637
Sawyer, D. S. 3: 134
Sawyer, Dale S. 12: 665
Schlanger, Seymour O. 8: 433
Scholz, C. H. 9: 489
Schulz, K. J. 10: 537
Sclater, J. G. 3: 134
Scotese, Chris 9: 487
Scotese, Chris 11: 604
Scott, David B. 5: 278
Scott, Gary R. 1: 50
Searle, M. P. 1: 43
Seeber, L. 7: 382
Sexton, John L. 7: 364
Shanmugam, G. 5: 231
Shanmugam, G. 11: 562
Shannon, J. R. 6: 293
Sharp, Warren D. 3: 162
Shea, James H. 9: 455
Shepherd, J. 5: 282
Shipley, T. H. 7: 339
Signor, Philip W., III 12: 625
Sillitoe, Richard H. 8: 403
Silver, L. T. 3: 126
Sims, John D. 3: 124
Sims, John D. 6: 314
Sinha, A. K. 11: 593
Smith, J. Fred, Jr. 6: 298
Smithson, Scott B. 5: 241
Snoke, Arthur W. 3: 162
Snoke, Arthur W. 5: 227
Speed, R. C. 8: 423
Spencer, Jon E. 10: 499
Spiker, E. C. 5: 246
Steinen, Randolph P. 9: 471
Steiner, D. 12: 645
Stoffa, Paul L. 7: 353
Stride, A. H. 9: 491
Stubblefield, W. L. 9: 491
Stubblefield, William L. 1: 27
Stubblefield, William L. 1: 31
Stuiver, M. 4: 215
Stuiver, M. 8: 438
Suzuki, Keido 8: 429
Swanson, Mark T. 6: 317
Swift, B. A. 3: 134
Szabo, B. J. 1: 23
Szabo, B. J. 8: 438
Szabo, Barney J. 4: 215
Szabo, Barney J. 5: 246
Tadahide, Ui 8: 429
Talwani, Manik 7: 353
Talwani, Pradeep 12: 654
Tapponnier, R. 12: 611
Tauxe, Lisa 10: 508
Taylor, Lawrence A. 12: 617
Tempelman-Kluit, D. J. 2: 70
Thatcher, W. 12: 637
Thomas, M. D. 8: 440
Thomas, William A. 9: 485
Thompson, Graham R. 8: 413
Thomson, Margaret C. 12: 641
Todd, Victoria R. 5: 227
Toksoz, M. N. 3: 134
Toy, Terrence J. 10: 524
Tucker, M. E. 12: 662
Tucker, Maurice E. 1: 7
Tull, James F. 9: 485
Tullis, Jan 5: 227
Twichell, D. C. 9: 491
Twichell, David C. 1: 27
Twichell, David C. 8: 408
Ujike, O. 8: 418
Uyeda, S. 7: 339
Valentine, P. C. 5: 246
Van der Voo, Rob 9: 487
Van der Voo, Rob 11: 604
Vernon, R. H. 2: 76
Verosub, Kenneth L. 7: 392
Vocke, Robert D. 4: 202
von Frese, Ralph R. B. 7: 364
Walker, B. M. 6: 293
Wardlaw, Bruce R. 1: 13
Washington, Paul A. 12: 665
Washington, W. M. 12: 633
Watson, E. Bruce 5: 236
Wehmiller, J. F. 5: 246
Wernicke, Brian 1: 3
Wernicke, Brian 10: 499
Wheeler, Russell A. 2: 61
Wheeler, Russell L. 2: 61
Whitmarsh, R. B. 9: 461
Willefert, Solange 5: 253
Williams, David L. 10: 503
Williams, Harold 10: 530
Wilson, James Lee 12: 659
Winchester, J. A. 9: 487
Wright, James E. 3: 162
Yamano, M. 7: 339
Yazidi, Abdelaziz 5: 253
Zandt, George 7: 376
Zenger, Donald H. 12: 662
Zietz, Isidore 11: 593

Just Received . . .

MEMOIR 155

The Geological Society of America — Life History of a Learned Society

By Edwin B. Eckel

with preface by Robert F. Legget

The Society's makeup, its governance, and its administration, including the management and preservation of its fortune, is presented in a topical rather than chronological form. This history reflects the methods, foibles, successes, and failures of the Presidents, Vice-Presidents, Councilors, and officers during the Society's 90 years. It is a fascinating record and fun reading.

Memoir 155, xiv + 168, 8½ x 11, hard bound, 133 photos, CIP, ISBN 0-8137-1155-X $24.50

MEMOIR 156

Geology and Tectonics of the Lake Superior Basin

Edited by Richard J. Wold and William J. Hinze

This state-of-the-knowledge compilation of geologic and geophysical studies will provide an overview of information related to the origin and development of the Lake Superior Basin and to the role and nature of the continental rifting process. Twenty-one papers by leading authorities. Book includes large 31 x 40 4-color map of area and two b&w overlays showing magnetics and gravity.

Memoir 156, vi + 280, 8½ x 11, hard bound, CIP, ISBN 0-8137-1156-8 ..... $38.50

Order your copies today! Mail check or money order in U.S. funds for full amount or include MasterCard or VISA account number, expiration date, and your signature. Member discount allowed when claimed. Colorado residents add sales tax.

ORDER FROM: Publication Sales, Geological Society of America, P.O. Box 9140, Boulder, CO 80301